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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/705,188	DENG ET AL.
	Examiner	Art Unit
	Shawn S. An	2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1,8-12 and 14-24 is/are rejected.
- 7) Claim(s) 2-7 and 13 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 10 November 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 7/18/05.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 8, 10-11, 14, 16, and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moghadam et al (5,682,197).

Regarding claim 1 and 16, Moghadam et al discloses a camera and a method comprising:

image sensor (Fig. 4, 14) for capturing a series of image frames each of a portion of a panoramic image scene; and

processor (32) for combining the image frames into a panoramic image while the series of image frames is being obtained (col. 3, lines 36-67).

Regarding claims 8 and 21, Moghadam et al discloses the image frames each comprising a strip of the panoramic image scene (Fig. 5).

Regarding claim 10, Moghadam et al discloses adjusting/correcting the dimensions (warped) to maintain the overlap (Fig. 7; col. 7, lines 50-67; col. 8, lines 1-10).

Regarding claims 11 and 22, Moghadam et al discloses providing a visual feedback to a user indicating the progress of the panoramic image (abs.).

Regarding claim 14, Moghadam et al discloses capturing a set of image frames that define a set of boundaries (segments of images) of the panoramic image (col. 4, lines 57-62).

Regarding claim 20, Moghadam et al discloses a memory (34) for storing portions of the image frames for the panoramic image (col. 3, lines 21-35).

3. Claims 9 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moghadam et al as applied to claims 1 and 16 above, respectively, and further in view of Colavin et al (7,064,783 B2).

Regarding claim 9, Moghadam et al does not particularly disclose the strips having a set of dimensions that are selected to maintain an overlap in the strips.

However, Colavin et al teaches forming a panoramic image comprising strips having a set of dimensions that are selected to maintain an overlap in the strips for producing a better panoramic image (Figs. 3, 6, and 9).

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art employing a panoramic camera as taught by Moghadam et al to incorporate Colavin et al's teachings as above so that strips have a set of dimensions that are selected to maintain an overlap in the strips for producing a better panoramic image.

Regarding claim 17, Moghadam et al does not particularly disclose the image frames including one or more image frames having a resolution that corresponds to a resolution of the panoramic image and one or more image frames having a resolution that is lower than the resolution of the panoramic image.

However, Colavin et al teaches forming a panoramic image comprising image frames including one or more image frames having a resolution (sensor resolution) that corresponds to a resolution of the panoramic image and one or more image frames having a resolution that is lower than the resolution (down sampling to VGA resolution) of the panoramic image, thereby forming a panoramic scene with more user control for correcting imperfections (col. 8, lines 19-26 and 65-67; col. 9, lines 1-18; col. 3, lines 6-14).

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art employing a panoramic camera as taught by Moghadam et al to incorporate Colavin et al's teachings as above so that image frames include one or more image frames having a resolution that corresponds to a

resolution of the panoramic image and one or more image frames having a resolution that is lower than the resolution of the panoramic image, thereby forming a panoramic scene with more user control for correcting imperfections.

Regarding claims 18-19, Moghadam et al does not particularly disclose the processor determining a relative motion between the image frames and further comprising a motion sensor.

However, Colavin et al teaches forming a panoramic image comprising determining a relative motion between the image frames (motion estimation) in order to produce a better panoramic image (col. 11, lines 49-61). Furthermore, a motion sensor is conventionally well known in the art.

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art employing a panoramic camera as taught by Moghadam et al to incorporate Colavin et al's teachings as above so that Moghadam's processor determines relative motion between the image frames, and utilize such as a conventional motion sensor for sensing the motion of the camera, so that the processor can implement the motion estimation to compensate/correct for the motion in order to produce a better panoramic image.

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moghadam et al as applied to claim 1 above, and further in view of Yoshida (5,500,707).

Regarding claim 12, Moghadam et al does not particularly disclose the visual feedback comprising providing a depiction of missing areas of the panoramic image.

However, Yoshida teaches a visual feedback comprising providing a warning of missing areas of the panoramic image so that the user can correct the problem (col. 12, lines 1-4).

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art employing a panoramic camera as taught by Moghadam

et al to incorporate Yoshida's teaching as above so as to provide a depiction of missing areas of the panoramic image so that the user can correct the problem.

5. Claims 15 and 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moghadam et al as applied to claims 1 and 16 above, respectively, and further in view of Colavin et al (7,064,783 B2) and Belz et al (7,053,953 B2).

Claim 15 substantially covers claims 23 and 24 limitations. Therefore, please refer to the following rejections.

Regarding claim 23, Moghadam et al does not particularly disclose means for performing a zoom in on an object of interest in the panoramic image such that the image sensor captures an image frame of the object of interest having a higher resolution than the image frames obtained from a remainder of the panoramic image and the processor records a set of metadata pertaining to the zoom.

However, Colavin et al teaches forming a panoramic image comprising means for performing a zoom in on an object of interest in the panoramic image such that the image sensor captures an image frame of the object of interest having a higher resolution (zooming provides a higher resolution of the image) than the image frames obtained from a remainder of the panoramic image, thereby forming a panoramic scene with more user control for correcting imperfections (col. 8, lines 19-26 and 65-67; col. 9, lines 1-18; col. 3, lines 6-14).

Furthermore, Beltz et al teaches a camera system comprising metadata pertaining to the zoom so that a photographer can have the desired rendered output image including only such data (col. 22, lines 15-34).

Therefore, it would have been considered obvious to a person of ordinary skill in the relevant art employing a panoramic camera as taught by Moghadam et al to incorporate Colavin et al and Beltz et al's teachings as above so as to perform a zoom in on an object of interest in the panoramic image such that the image sensor captures an image frame of the object of interest having a higher

resolution than the image frames obtained from a remainder of the panoramic image, thereby forming a panoramic scene with more user control for correcting imperfections and Moghadam's processor records a set of metadata pertaining to the zoom so that a photographer can have the desired rendered output image including only such data in order to produce a better enhanced panoramic image.

Regarding claim 24, based on combination of references, since Colavin et al teaches combining the image frame of the object of interest with the remainder of the panoramic image (col. 8, lines 19-26 and 65-67; col. 9, lines 1-18) and Beltz et al teaches metadata pertaining to the zoom (col. 22, lines 15-34), it would have been considered obvious to one of skill in the art to recognize Moghadam's processor combining the image frame of the object of interest with the remainder of the panoramic image in response to the metadata in order to produce a better enhanced panoramic image.

Allowable Subject Matter

6. Claims 2-7 and 13 are objected to as being dependent upon rejected base claim 1, but would be allowable:

if either claim 2 or claim 13 is rewritten in independent form including all of the limitations of the base claim 1 and any intervening claims.

Dependent claim 2 recites novel features comprising:

capturing a first image frame having a resolution that corresponds to a resolution of the panoramic image; and

capturing a second image frame having a resolution that corresponds to the resolution of the panoramic image if a relative motion between the first and second image frames is detected.

Dependent claim 13 recites a novel feature comprising a step of providing a depiction of areas of the panoramic image that need to be re-sampled.

The art of record fails to anticipate or make obvious the novel features.

Accordingly, if the amendments are made to the claims listed above, and if rejected claims are canceled, the application would be placed in condition for allowance.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to *Shawn S. An* whose telephone number is 571-272-7324.

8. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



SHAWN AN
PRIMARY EXAMINER